

Personal Health Maintenance

Personal Health Promotion

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Mortality data on the leading causes of death conceal the relationship to underlying risk factors; if we classified deaths according to risk factors, annually there might be an estimated 350,000 smoking-related deaths, 200,000 alcohol-related deaths and 135,000 nutrition-related cancer deaths. Similarly, five causes of death—heart disease, lung cancer, cirrhosis of the liver, suicide and motor vehicle accidents—contribute most to the risk of dying in the next ten years for a 40-year-old white man. Review of protective factors shows that adopting and maintaining a healthful life-style can contribute to reducing risk. Practicing physicians can assume both direct and indirect roles in promoting personal health maintenance.

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The late John H. Knowles, writing in a 1977 issue of *Daedalus*, passionately argued the case for "The responsibility of the Individual" in advancing the nation's health status:

Central to [our] culture is faith in progress through science, technology, and industrial growth; increasingly peripheral to it is the idea, vis-à-vis health, that over 99 percent of us are born healthy and are made sick as a result of personal misbehavior and environmental conditions. The solution to the problems of ill health in modern American society involves individual responsibility, in the first instance, and social responsibility through public legislation and private voluntary efforts, in the second instance.¹

Knowles was neither the first nor the last to observe how much individual persons can do to reduce premature death by taking responsibility for their own health. However, because Knowles was the head of Massachusetts General Hospital at that time, his detailed review of the hazards of life-style choices helped crystallize the growing realization of the limits of medical care and the promise of promoting personal health.

Personal health promotion should not be viewed simply as a question of wise or unwise choices by individuals acting alone. The idea that persons can influence their health destiny is a positive one; it is not a negative assignment of blame. However, a natural outgrowth of a concept of individual responsibility, from a public health perspective, is community responsibility—collective citizen involvement in defining priority health promotion needs and stimulating community efforts to address them. Persons can hardly be expected to avoid the health risks imposed by personal choices about life-style when they do not know or understand these risks, when they lack the knowledge or skills needed to choose a healthier

life-style or, worst of all, when they seek guidance or support from their community and it is unavailable to them. Social, economic and political actions to create a community environment conducive to health are inseparable from individual responsibility for health. Personal health promotion includes all these components.

In the past decade health promotion and disease prevention have become firmly established, in principle, as central elements of the health policy of Western nations. The Canadian "Lalonde Report," issued in 1974, was instrumental in formulating the health field concept—that is, the allocation of preventable death and morbidity to four broad sources, or "fields."²

One field, human biology, consists of those health problems inherent in the makeup of a person and not generally considered preventable. A second, environment, consists of health problems caused by environmental and occupational exposures. A third field, health systems, deals with those health problems that can be avoided or cured by removing inadequacies in health care. The fourth field, life-style, consists of problems that arise as a result of personal behavior choices and that can be prevented by adopting or maintaining protective behaviors.

The Lalonde report was soon joined by similar national policy documents in the United States,^{3,4} Australia⁵ and the United Kingdom⁶ (see Table 1). Two Public Health Service publications, *Healthy People: A Report of the Surgeon General on Health Promotion and Disease Prevention* and its influential companion document, *Promoting Health/Preventing Disease: Objectives for the Nation*, both widely

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TABLE 1.—Official Health Policy Statements That Advocate Personal Health Promotion

Title	Country	Year
A New Perspective on the Health of Canadians	Canada	1974
Prevention and Health: Everybody's Business	United Kingdom	1976
Disease Prevention and Health Promotion: Federal Programs and Prospects	USA	1978
Model Standards for Community Preventive Health Services	USA	1979
Healthy People: A Report of the Surgeon General on Health Promotion and Disease	USA	1979
Promoting Health: Prospects for Better Health Throughout Australia	Australia	1979
Promoting Health/Preventing Disease: Objectives for the Nation	USA	1980

ABBREVIATIONS USED IN TEXT

CDC = Centers for Disease Control

HRA = health risk appraisal

WHO = World Health Organization

distributed, were viewed by the public health community as major statements of a new emphasis in US health policy. These policy documents are significant in several respects:

- They reflect their prevention priorities based directly on epidemiologic review of preventable illness and death.
- They state goals and objectives for prevention in terms of measurable disease outcomes and quantified reductions in risk.
- They identify health promotion—both in the titles and in the expected contribution to better health in the ensuing decade—as an equal partner with the more traditional public health strategies of disease prevention. In *Promoting Health/Preventing Disease: Objectives for the Nation*, 226 measurable objectives are listed as attainable by 1990; 78 of these are explicitly listed under the heading “Health Promotion.” However, an additional 30 objectives, although listed under the headings “Health Protection” and “Preventive Health Services,” actually address health behaviors and educational outcomes. Hence, virtually half of all the 1990 prevention targets relate to individual health promotion.

This major emphasis on individual health promotion has emerged as a result of many converging influences. First, at all levels of government, public officials are greatly concerned over the enormous increases in public expenditures for medical care. While it would be a great mistake to suppose that health promotion alone can or will stop the rise in medical care costs by 1990, attaining the national prevention objectives could postpone some of the need for services.

Second, health promotion affirms a widely held American belief in individual and family responsibility. Many Americans want to control their own lives and make their own life-style decisions. They welcome programs that help them adopt or maintain healthful life-styles. Opinion polls have documented substantial public recognition of the value of promoting health and of public support for programs.⁷

A third basis for this new emphasis is the body of knowledge that has resulted from the past three decades of epidemiologic research. It is unlikely that an entire issue of a major medical journal could be devoted to the topic of health promotion had it not been for the brilliant work of epidemiologists, biostatisticians and clinicians during this period. Numerous studies and trials have established significant associations and causal relationships between a variety of behavioral risk fac-

tors and the major health problems of today, and have documented that improved outcomes result from reductions in risk factors. In a very real sense, health promotion is “applied epidemiology.”

Thus it is not surprising that a high priority on promoting health is evident in policy documents based on epidemiologic reviews of health-status data. This can be shown with two analyses of vital statistics data.

Life-style-Related Mortality

In the United States, about 1.9 million people die each year. The leading causes of death—heart disease, cancer, stroke, accidental injury and pneumonia/influenza—are well known. Many of these deaths are premature, but their relationship to preventable risk factors is obscured by our disease-organ system schema for classifying vital events. Consider how the vital statistics data might look if we classify deaths according to risk factors.

Smoking-Related Deaths

Cigarette smoking is the single most preventable health problem in America today. In 1965, the year after the first Surgeon General's report on smoking, the prevalence of smoking among adults was 42%, and it declined steadily over the next two decades.⁸ However, this trend masks a substantial increase in smoking among women during the same period. In cooperation with states, the Centers for Disease Control (CDC) conduct surveillance of behaviors of public health significance, including smoking. The CDC's behavioral risk factor surveillance data indicate that 31.5% of American men and women still smoke (Table 2).

Cigarette smoking accounts for an estimated 350,000 deaths each year.⁹ However, these deaths are tabulated under heart attacks, cancer and chronic obstructive lung disease. The shocking dangers to which 50 million smokers are exposed are not obvious to them or to their families and friends. To highlight the dimension of the problem another way, imagine the public outcry if 1,000 people died as a result of a natural disaster. Yet, 1,000 people die *every day* from cigarette smoking, and it goes unrecorded and unremarked.

Alcohol-Related Deaths

While a significant fraction of American adults who use alcoholic beverages do so moderately, the misuse of alcohol is still an important cause of premature death. Behavioral risk factor surveillance data suggest that 22.7% of adults have had five or more drinks on an occasion, one or more times in the past month (Table 2). Moreover, 6.2% reported driving after having too much to drink one or more times in the past month. (These data become even more startling when age- and sex-

TABLE 2.—National Prevalence Estimates for Adults, by Sex, Behavioral Risk Factor Surveys, 1981 Through 1983

Risk Factor	Men	Women	Total
Cigarette smoking*			
Prevalence (%).	34.0	29.1	31.5
95% CI.	(32.0, 35.9)	(27.5, 30.8)	(30.2, 32.7)
Heavy drinking†			
Prevalence (%).	33.4	12.9	22.7
95% CI.	(31.4, 35.4)	(11.7, 14.7)	(21.5, 23.9)
Obesity‡			
Prevalence (%).	23.6	21.7	22.6
95% CI.	(21.8, 25.5)	(20.3, 23.2)	(21.5, 23.8)

CI=confidence interval

*Current smoker.

† Defined as a person who has drunk five or more drinks on an occasion, one or more times in past month.

‡ 120% of ideal weight (defined as the mid-value for a medium-frame person on the 1959 Metropolitan Life Insurance Company height/weight tables).

From the Centers for Disease Control Behavioral Risk Factor Surveillance System (combined state surveys covering residents of all states except Hawaii).

specific prevalences are calculated. One of every seven young men reported drinking and driving in the past month.¹⁰) Alcohol abuse accounts for an estimated 200,000 deaths annually,¹¹ but, again, these are tabulated as deaths due to motor vehicle and other accidents, cirrhosis, homicide and suicide, and head and neck cancers.

Nutrition

Diet and nutrition are clearly significant to health, although the direct contribution that a prudent diet makes to health promotion is hard to measure. Even after controlling for other risk factors, obesity appears to be associated with an increased cardiovascular risk.¹² In addition, behavioral risk factor survey data indicate that 22.6% of adults are overweight—that is, 120% or more of “ideal” weight for a reference population (see Table 2). Recent results from clinical trials conducted by the National Institutes of Health suggest that dietary change can reduce high cholesterol levels and that this has a protective effect on cardiovascular outcomes.¹³ The evidence that various common types of cancers are avoidable by dietary means is plausible but controversial. Doll and Peto estimate that it may ultimately be possible to reduce US cancer death rates by as much as 35% through practical dietary means.¹⁴ If that is so, some 145,000 cancer deaths per year could be classified as nutrition-related.

When mortality data are recast in this fashion, the importance of individual health promotion is inescapable.

Probability of Dying in the Next Ten Years

The Centers for Disease Control have been actively involved in developing a health promotion tool known as the health risk appraisal, or HRA. HRA is a computer-based inventory that allows a person to estimate his or her risk of dying in the next ten years based on a profile of that person's health behavior—smoking or not, using seat belts or not, controlling high blood pressure or not, and so forth. As the base for these computations, HRA uses age-, race- and sex-specific tables on the probability of dying in the next ten years, by specific cause. The HRA uses epidemiologic relative risks associated with reported health behaviors to calculate increments and decrements in the probability of dying. The method

was originally developed to help physicians practice “prospective medicine.”¹⁵

Today health risk appraisal is conducted in a variety of settings. It is used to help people understand changes in health behavior that can make the greatest impact on their life expectancy, and to motivate them to become involved in the health promotion programs offered by HRA sponsors.

The same data set can be used qualitatively to compare two strategies: one is the contributions that more and better medical care can make to reducing risk of premature death, the other the contributions that protective behaviors can make. That is, among 40-year-old white men, there would be an estimated 4,578 deaths in the next ten years per 100,000 population.¹⁶ Five causes of death, however, account for half of the deaths among white men in this age group.

The leading cause of death is heart disease (Table 3 highlights some of the major protective factors against heart disease). The US death rate from heart disease has been dropping quite dramatically for 16 years. No one knows the specific contribution of each factor, but it is reasonable to attribute this improvement to a number of changes:

- Over the past 20 years at least a portion of the American public has made striking behavioral changes: some have been *dietary*—switching from saturated fats to unsaturated fats.¹⁷ Some have involved *exercise*. Millions of Americans have incorporated exercise as part of leisure-time activities, the cardiovascular benefits of which may be substantial.¹⁸ Most significant of all, during the 15 years after the first Surgeon General's report on smoking, an estimated 30 million adults stopped *smoking*.¹⁹

- There have been important advances in cardiology, coronary bypass procedures, hospital coronary care units and emergency services.

- Controlled trials show that even modestly increased blood pressure increases the risk of cardiovascular disease. This knowledge has been accompanied by significant improvements in controlling blood pressure—partly through medical strategies (drug therapy) and partly through behavioral strategies (weight control and exercise).

- Recent research has confirmed that lowering the cholesterol level reduces the risk of coronary heart disease—again,

TABLE 3.—*The Five Leading Causes of Dying in the Next Ten Years for 40-Year-Old White Men and Protective Factors*

Leading Cause	Major Protective Factors
Heart disease	Coronary care and EMS—medical advances High blood pressure—control Cholesterol—reduced Diet—lower saturated fat Exercise—increased Smoking—reduced prevalence
Lung cancer	Nonsmoking Protection from occupational or environmental exposure
Cirrhosis of the liver	Alcohol—moderate use
Suicide	Hope, meaning in life, family and community support, treatment of depression, nonuse of drugs/alcohol
Motor vehicle accidents	Alcohol—not drinking and driving Seat belts—regular use Roadways, vehicles—safer design Trauma care and EMS—medical advances

EMS=emergency medical services

From the Center for Health Promotion and Education, Centers for Disease Control, 1982.¹⁶

partly through medical treatment (drugs) and partly through behavioral means (diet, exercise).¹³

Thus, for the 40-year-old white men cited in our example, it is reasonable to conclude that the risk of dying of heart disease in the next ten years is substantially related to their health behavior choices.

This is even more obvious when we consider the probability, for 40-year-old white men, of dying in the next ten years from the second most frequent cause of death, lung cancer. The 1982 Surgeon General's report on the health consequences of smoking stated that an estimated 25% of all cancer deaths in the United States are due to lung cancer and 85% of these are due to cigarette smoking.²⁰ Refraining from smoking is the primary intervention, with medical care having modest impact on survival once lung cancer develops (Table 3).

For 40-year-old white men, the next three leading causes of death in the next ten years are cirrhosis of the liver, suicide and motor vehicle accidents (Table 3). Known or potential risk-reducing opportunities exist in each of these categories.

Obviously, the point is not that medicine is unimportant—the life tables already incorporate the life-saving contributions of past medical care advances. Rather, the findings show how heavily the risk of dying in the next ten years is weighted by life-style-related ailments, and thus how much healthful behavior choices could contribute to reducing risk.

The Role of Health Education

At the 1983 General Assembly of the World Health Organization (WHO), Margaret Heckler, Secretary of the US Department of Health and Human Services, described the central role health education must play in addressing the health problems of the future:

In the United States, we have placed new emphasis on the prevention of disease. Of special importance is the development of a national awareness that individuals must take action on their own behalf to prevent disease and to promote good health. This new emphasis recognizes a simple fact: that even

though our medical resources can go far in curing disease, each individual can make daily choices to prevent disease. WHO's goal of health for all by the year 2000 embodies the same principle and depends on the development of a global awareness of the individual's responsibility for his or her health.

We have learned much about the relationships between health and individual action, but the real challenge is to convey this information and motivate individuals to act.

Health education is frequently perceived as lacking evidence of efficacy, which sometimes is translated, inaccurately, to mean "ineffective." The lack of documentation is quietly changing. Rigorous evaluation models have been described.²¹ Moreover, in recent years, excellent studies have emerged in the public health literature. In one, Morisky and colleagues report substantial reductions in hypertension-related mortality among low-income black women participating in a health education program in a hospital setting, compared with a control group not in the program.²² Warner and Murt's cohort analysis indicates that more than 200,000 premature deaths were averted as a result of antismoking campaigns between 1964 and 1978.²³ Recently, Sexton and Hebel reported on a clinical trial conducted among pregnant smokers in a control group and in an experimental group that received smoking cessation services. The trial documented reductions in maternal smoking and increases in infant length and birth weight.²⁴ It is increasingly clear that well-conceived, well-designed and well-conducted health education programs can yield measurable outcomes.

Community-Based Health Promotion

The focus of health promotion activities at the Centers for Disease Control is increasingly on collaborating with states to stimulate effective community health promotion efforts. The 1990 prevention objectives are given in terms of national outcome measures, but national outcomes are nothing more than a summation of community outcomes. One essential requirement for a community-based approach is acquiring and using community-specific data. We recommend the use of risk-factor prevalence surveys, vital statistics and demographic information to characterize target groups.

A community-based approach also requires convening a representative cross-section of health professionals and community leaders to reach consensus on the priority health problems in the area toward which health promoting activities may be directed. Some of these may be educational, to support individual behavior change—such as smoking prevention programs. Others may be communitywide, to promote recognition of healthful life-styles as a community norm—such as the passage of measures requiring the use of child safety seats in automobiles.

All of a community's institutions need to be mobilized for this effort. Schools need to offer effective school health education programs; despite the availability of high-quality curricula, only a small fraction of the nation's schoolchildren are exposed to them. The worksite offers an attractive setting for promoting health when business or labor unions, or both, choose to sponsor activities for workers. State and local health departments and community voluntary agencies are playing an increasing role in sponsoring programs. Health care facilities have been active in patient education and can be an excellent focus for personal health promotion programs as well. For example, some health maintenance organizations and community hospitals have begun to offer programs for

patients and staff and, in some cases, for the community at large.

Physicians' Role in Promoting Health

If the medical care sector is in fact a logical setting for health promotion and education, it is difficult to escape the conclusion that physicians should be active participants. Dismukes and Miller, in a commentary on the role of physicians in promoting health, note that most physicians enjoy good health and are more likely to practice good health habits than other populations. Yet, Dismukes and Miller also note that among physicians there is little interest in, and even active resistance to, the introduction of health promotion in medical encounters: "This attitude creates a strange paradox for the medical profession. Physicians have discovered some secrets of better health, but are reluctant or ineffective in communicating them to their patients."²⁵ It is not only a paradox but an irony, for medicine is able to contribute much more than it does. There are in fact multiple roles physicians can play in personal health promotion.

Public respect for the medical profession accords physicians a role as community leaders. Physician leadership can help galvanize a community to recognize the need for promoting healthful activities and to mobilize the human and financial resources to respond. More particularly, as public health departments move into health promotion, medical societies and practicing physicians need to encourage and support local health officials.

In addition, primary care offers a uniquely appropriate setting for integrating health promotion into health-focused service delivery. Nelson and Simmons note that three fourths of the population visit a physician annually, are likely to need preventive activities regardless of the purpose of the visit and, because of their high regard for their personal physician, are likely to grant them "great influence over health attitudes and behavior, particularly in the long run."²⁶

Russell and associates evaluated a simple one- to two-minute smoking education effort directed by a group of British physicians to their smoking patients. One might view the effort as ineffective because only about 5% of the patients stopped smoking (one-year follow-up). However, Russell and co-workers point out that the net yield of ex-smokers was the equivalent of 25 successes per physician each year. To put it another way, "if all of 20,000 or more GPs in Britain were to adopt this simple measure the total could exceed half a million ex-smokers a year."²⁷ If the nearly 50,000 physicians who read *The Western Journal of Medicine* were as effective in this regard as the British physicians included in the study by Russell and associates, the equivalent yield would exceed 1 million ex-smokers a year. It is hard to imagine another health education measure with equivalent potential.

All practicing physicians are involved in health communication on a daily basis. The only question is the degree to which they acknowledge the role and the skill they bring to the interactions. Realizing the promise of personal health promotion in the 1980s does not require that physicians cease to be concerned with diagnosing and healing current ills, but rather that they broaden their interests to protecting the current health of patients and their families.

REFERENCES

1. Knowles JH: The responsibility of the individual. *Daedalus* 1977 Winter; 106:57-80
2. Lalonde M: A New Perspective on the Health of Canadians. Ottawa, Government of Canada, 1974
3. Healthy People: A Report of the Surgeon General. US Dept of Health, Education, and Welfare publication No. (PHS) 79-55071. Government Printing Office, 1979
4. Promoting Health/Preventing Disease: Objectives for the Nation, Public Health Service, US DHEW, Government Printing Office, 1980
5. Promoting Health: Prospects for Better Health Throughout Australia. Canberra, Commonwealth Department of Health, Australian Government Publishing Service, 1979
6. Prevention and Health: Everybody's Business, Department of Health and Social Security. London, Her Majesty's Stationery Office, 1976
7. Toltsma DD: Health promotion/disease prevention—A societal imperative. *Conn Health Bull* 1983; 97:284-288
8. Health, United States, 1983, US Dept of Health and Human Services, Public Health Service. Government Printing Office, 1983, p 260
9. The Health Consequences of Smoking: A Report of the Surgeon General, DHHS. Government Printing Office, 1979, p ii
10. Toltsma DD: Occupant protection in health promotion: An epidemiologic framework. *Health Educ Q*, in press
11. Alcohol, Drug Abuse, and Mental Health Administration: Alcohol and Health, US DHEW Public Health Service. Government Printing Office, 1978, p 12
12. Hubert HB, Feinleib M, McNamara PM, et al: Obesity as an independent risk factor for cardiovascular disease: A 26-year follow-up of participants in the Framingham Heart Study. *Circulation* 1983 May; 67:968-977
13. Lipid Research Clinics Program: The lipid research clinics coronary primary prevention trial results—I. Reduction in incidence of coronary heart disease. *JAMA* 1984; 251:351-364
14. Doll R, Peto R: The Causes of Cancer: Quantitative Estimates of Avoidable Risks of Cancer in America Today. Oxford, NY, Oxford University Press, 1981, p 1235
15. Robbins LC, Hall JH: How to Practice Prospective Medicine. Indianapolis, Methodist Hospital of Indiana, 1970
16. Probability of Dying Within the Next 10 Years at Selected Ages for 40 Major Causes. Atlanta, Center for Health Promotion and Education, Centers for Disease Control, 1982, p 10
17. Walker WJ: Changing U.S. life style and declining vascular mortality—A retrospective (Editorial). *N Engl J Med* 1983 Mar; 308:649-651
18. Paffenbarger RS Jr, Hyde RT, Wing AL, et al: A natural history of athleticism and cardiovascular health. *JAMA* 1984; 252:491-495
19. Smoking and Health: A Report of the Surgeon General. US Dept of Health, Education, and Welfare publication No (PHS) 79-50066. Government Printing Office, 1979, p vii
20. Health Consequences of Smoking—Cancer: A Report of the Surgeon General. US Dept of Health and Human Services publication No. (PHS) 82-50179. Government Printing Office, 1982, p vi
21. Green LW: Evaluation and measurement: Some dilemmas for health education. *Am J Public Health* 1977; 67:155-161
22. Morisky DE, Levine DM, Green LW, et al: Five-year blood pressure control and mortality following health education for hypertensive patients. *Am J Public Health* 1983; 73:153-162
23. Warner KE, Murt HA: Premature deaths avoided by the antismoking campaign. *Am J Public Health* 1983; 73:672-677
24. Sexton M, Hebel JR: A clinical trial of change in maternal smoking and its effect on birth weight. *JAMA* 1984; 251:911-915
25. Dismukes SE, Miller ST: Why not share the secrets of good health? *JAMA* 1983; 249:3181-3183
26. Nelson EC, Simmons JJ: Health promotion—The second public health revolution: Promise or threat? *Fam Commun Health* 1983; 5:1-15
27. Russell MAH, Wilson C, Taylor C, et al: Effects of general practitioners' advice against smoking. *Br Med J* 1979; 2:231-235